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ABSTRACT

This task force report adopts the definition of instructional technology presented by the President's Commission on Instructional Technology and outlines a series of educational problems which demonstrate the need for increased use of instructional technology. A list of six benefits of instructional technology for education, also taken from the report of the President's Commission on Instructional Technology, is used as a basis for recommending changes in teacher education to include more use of and instruction in educational technology. The report concludes with a list of recommendations for teacher educators, industry representatives, and teacher organizations. (RT)

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INSTRUCTIONAL TECHNOLOGY IN TEACHER EDUCATION

Report of Task Force on Instructional Technology

Associated Organizations for Teacher Education

DECEMBER 1970

SP005142

INTRODUCTION

Over the past several years the Task Force on Instructional Technology of AOTE has investigated various education problems of mutual interest to representatives of education and education industries. It began its work with a questionnaire study of reactions by representatives from education and industry to a document on the programming of instructional sequences.[1] Early in 1969 the Task Force conducted several meetings in Chicago with education and industry representatives. Later it met with a small number of industry representatives in Cleveland in the Spring, 1970, to consider as a final action the nature of a paper on education/industry cooperation in the use of instructional technology in teacher education. The paper was to be distributed by AOTE and other interested groups.

The decision to culminate Task Force activities with a position statement derived from several factors. One was the judgment of the AOTE Advisory Council that their best and most realistic contribution to the problem was to take leadership in stimulating others to take specific action. The second factor was a recognition by the Council that industry/education cooperation in the use of instructional technology in teacher education was an urgent problem that needed exploration. A paper on the subject was felt to be necessary to provide a conceptual framework for reflecting the position of AOTE and industry representatives and to suggest courses of action.

The initial stages of Task Force activities focused upon the uses of educational technology in education generally. Since action upon a problem of this magnitude was beyond the capabilities of AOTE, it was deemed advisable to select that part where AOTE had the most direct concern, namely, teacher education. As a consequence, the paper presented here stresses education/industry cooperation in the applications of instructional technology to teacher preparation and implications for education generally. Thus, the general purposes of this paper may be categorized as: (1) to provide a conceptualization of the potential influences of instructional technology in teaching-learning processes, (2) to explore the implications of this conceptualization for programs of teacher preparation and for education generally, and (3) to suggest areas where education/industry cooperation may assist in the improved use of instructional technology in teacher education.

There is little need to elaborate upon the necessity for industry/education cooperation. The roles that industries and private consulting groups have already assumed in meeting educational problems are well known, and are becoming more pervasive. Recent involvement of private agencies in education are evident in "performance contracting" with school systems where, for a predetermined fee, agencies guarantee that learners will achieve prescribed performance levels in selected subject areas when submitted to a system of instruction devised by the contracting agency. Penalties against the private agency are fixed for failure of learners to achieve criterion levels of achievement within given time limits.

In addition to many evidences of industry cooperation in education,

from decades of production of school supplies to the modern-day "performance contracting," further need for such cooperation is stressed in one of the recommendations of the President's Commission on Instructional Technology. It is proposed that:[2]

> The National Institute of Instructional Technology should take the lead in bringing businessmen and educators together in a close working relationship to advance the productivity of education through technology.
>
> To this end, the National Institute of Instructional Technology should consult with other interested organizations and develop an appropriate mechanism. A possible course of action, for example, could be the establishment of a National Council of Education and Industry that would focus on how technology can best meet the needs of individual students, teachers, and administrators. A small high-level council of this nature, with representatives from key branches of education and the education industry, could help to speed appropriate advances in the design, development, and application of technology to instruction.

The Report of the Commission recommended further that the functions of the proposed National Council of Education and Industry encompass the following:[3]

1. The establishment of standards for instructional equipment.
2. Concerted action to meet the specific needs of schools and colleges.
3. The development of practical methods to make equipment and materials compatible.
4. The establishment of a mechanism—perhaps a clearing-house—to provide education's managers with comparative operating and economic data on technological instruments and systems designed for administrative as well as instructional purposes.
5. Initiating or improving laws and regulations affecting instructional technology (e.g., copyright laws, satellite controls, reduced rates for long-distance educational communication).
6. Active cooperation with the National Institute of Instructional Technology in devising ways of directing federal and private funds toward the production of high-quality instructional materials.
7. Exploration of new methods of providing school districts with funds for instructional technology, including the possibility of leasing or renting equipment or the purchase of equipment on a "pay-as-you-go" basis.
8. Active cooperation with educational institutions, under National Institute of Instructional Technology leadership, in establishing practical programs to train and retrain the managers of education.

Critical to the accomplishment of these ends is the perception of teacher educators and industry representatives of the goals of education and the purposes of teacher education. Also critical is what each group perceives as its realm of cooperation. Educators may have quite limited notions of

what townspeople and business men may have to contribute to education. Likewise, non-school agencies in the community may have never thought of teacher education as a partnership, particularly where it concerned the contribution of their expertise to the solution of educational problems.

The discussion which follows broadens dimensions of teacher education to include more than the traditional province of teacher education institutions. It suggests that in the realm of instructional technology, at least, educators and industry representatives can do much together to improve the preparation of teachers.

INSTRUCTIONAL TECHNOLOGY IN TEACHING AND LEARNING PROCESSES

The President's Commission cited earlier has defined instructional technology as:[4]

> "a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on findings from research in human learning and communication, and employing a combination of human and nonhuman resources to bring about more effective instruction."

The Task Force on Instructional Technology subscribes to this definition, taking the position that while the immediate task seems to be concerned with the application of films, television, computers, and similar devices and materials to teacher education, long range consideration must place these devices and materials in proper perspective. Instead of a narrow, limiting view, this perspective demands a delineation of the uniqueness of each device, material, and instructional arrangement so that teacher preparation, and subsequent instruction of learners, encompasses the best combination of factors to evoke maximum learning for both teachers in preparation and for students under their guidance. The nature of instructional technology and the scope of this paper thus go beyond more traditional concepts which equate instructional technology with audio-visual education, or educational media. Educational media are traditionally regarded as special sources for effective instruction, unique in themselves and equally important with other avenues and means of instruction. To be understood better, however, media should be viewed in a context of use which highlights the best combinations of uniqueness of *all sorts* of mediating agents and arrangements for instruction. Thus, teachers must be regarded as mediating agents—or mediators—with good or poor qualities in the same way as motion pictures are considered. In certain cases the motion picture is preferable to the teacher for mediating between the learner and the "content" which the learner may be studying. The same may be said about other forms of media, such as words, symbols, pictures, and objects. The point is that the teacher *and* traditional media *must be regarded together* as agents of communication.

It is significant to note that the definition of instructional technology formulated by the President's Commission is a "process" definition rather than one which equates the word technology with materials and instruc-

tional equipment. This point must be kept in mind when assessing the contributions of instructional technology to teacher education and to learning generally. A major thrust of this paper will be lost if the reader thinks of technology as machines and things and not as the application of planning techniques to the orchestration of all factors contributing to improved learning.

The commission in Instructional Technology expanded even further on the pervasive nature of instructional technology when it said:[5]

> Instructional technology simultaneously draws from and contributes to an underlying science of learning. The technology of instruction is shaped by, as it will shape, the purposes and the substance of education. Unless technological means are harnessed to humane ends, with full regard for individual diversity and needs, no real benefit will accrue to society—indeed, the reverse is more likely.
>
> Furthermore, instructional technology is integrally involved with the process of learning and the genuine individualization of learning. Any sharp distinction, then, between research and development in instructional technology, on the one hand, and research and development in the basics of education, on the other, appears to be arbitrary. In fact, this very decision has contributed to the disappointing impact thus far of instructional technology—so frequently heralded, so seldom realized down the years since 1913 when Edison proclaimed the motion picture as the prospective agent of complete school reform."

The position taken by the Commission is in agreement with the conclusions of the Task Force of AOTE. The latter group recommends for the effective application of instructional technology to the purposes of teacher education and of learners there must be developed a science of learning and a science of teaching which systematically accounts for the contributions or failures of instructional technology in solving educational problems. It is insufficient in teacher preparation to focus efforts on the contributions of motion pictures, video-tape recordings, filmstrips, and field trips, in isolation from the broad problems of learning with which a teacher must deal. This happens in too many teacher preparation institutions, whether caused by lack of equipment and facilities, or narrow conceptualizations of the contributions of instructional technology to learning. A sine qua non for supporting the effective use of instructional technology by teachers is an environment for learning *about* teaching *and* an environment *for* teaching replete with the latest technology that the "science" of education and industry can provide. The teacher in training and the certified teacher need to be in a "laboratory" in which there is a constant interplay of decisions about and experimentation with a variety of materials, equipment, and arrangements devised to evoke specific learner responses. In addition, the teacher in preparation must be treated as an individual learner to the same degree that individualization of instruction has been found to be useful with learners in the public schools. The transference by teachers of skills in the use of instructional technology to the learner's environment is more apt to occur if the teacher

is immersed during training with problems of instructional technology than if the training environment does not support at all or limits such experiences.[6]

> Communication technology is woven into the fabric of society. The technology controls, persuades and seduces in all aspects of existence. The fantastic power generated by this communications bombardment forces questionable living patterns upon society—that may or may not be in our best interests! The society of tomorrow will need a population of individuals who are responsible, creative, and productive. Education must insure their presence. Political, social, economic and physical environmental characteristics demand new styles of education. The operation of formal and informal learning environments needs to become increasingly interdependent and complementary. Education needs to accelerate its inclusion of changing factors of a rapidly changing society. Media and technology can bring environmental awareness into teacher education and teacher-learner relationships.
>
> Just as scientists and engineers have changed and are changing our world far beyond the wildest futuristic dreams of individuals, education must be constantly changed and augmented and must prepare the learner for change. It may well be that the test of an educated person in the future may be his ability to adapt to change.
>
> Many people believe that education was once the province of educators but now there is no sector of our society that does not have a vital interest in what can be taught to whom, how, and by when.[7]

The conditions implied above as urgent for more effective teacher education are consistent with predictions of those who have projected the nature and future of the educational enterprise. A study, by the General Electric Company said this:[8]

> Out of the developing ferment on the campuses, in regional research centers and corporations' ventures into the field will come new approaches to organization, methodology and materials, e.g.:
>
> —as in business, there will be an approach toward "individuation". . . . Increasing emphasis will be placed on having every child proceed at his own pace through the learning process.
>
> —partly as a consequence of this development, there will be movement toward greater flexibility in scheduling school-time, and in class size.
>
> —the self-contained classroom is on its way out, to be replaced by a "mix" of large-class sessions, small group discussions and individual learning; by departmentalization and team teaching.
>
> —much greater use will be made of new materials, especially audio-visual materials. . . . Computer-assisted instruction will take hold, though more slowly, partly because of cost, partly because of the difficulty in developing "software".
>
> —there will be increased emphasis, and modernization, of vocational courses, with companies (and unions) participating more in the structuring—and even the conduct—of these courses.

The report goes on to predict a struggle to maintain quality education, particularly in colleges. This will be due to an increased demand by the general public for college education. Coupled with this will be a growing demand for education as a life-long process, outgrowing the capabilities of traditional educational institutions.

> Regardless of any expansion in their facilities and staff . . . education will become a partnership of business, unions, government, educational and other organizations, and the process beyond the high school/college phase will be more institutionalized . . .
>
> This continuing education/development process will have to be extended from the managerial/professional ranks to other, non-college-educated employees. Only in this way will we be able to avoid the pitfall of creating a new version of a "two-class" work force; and only thus will we ensure development of a truly fluid and open society and the full utilization of every individual's abilities.

Other trends concerning the nature of educational systems and instructional procedures must be noted for their effects upon programs of teacher education. With the tremendous increase in knowledge, time has long passed when any person could be expected to master the content of a given specialization. It is now impossible, even considering national efforts at abstracting and codifying information, to have ready access to *all* knowledge related to a given topic. Thus, logic and practice dictate a gradual shifting in instruction from the transmission and acquisition of great amounts of information to the development in instruction of thought processes and of preparation for change. Since the importance of education is increasing, learners will also learn to become less content with authoritarianism and organizational restraints. Education thus becomes more an investment for a fuller life, rather than a period of preparation for the immediate. The discontent of college students who urge changes in educational institutions and the "establishment" is said to reflect in part a need for emphasis upon ethical and philosophical problems of life rather than upon becoming another "acquisitive" member of our society. As noted in the General Electric Report, ". . . job enlargement may well be a sine qua non for holding the interest and motivating the performance of tomorrow's college or high school graduate."[9]

Additional dimensions of the education scene which will affect the nature of teacher education and the applications of instructional technology to learning problems are either implied or directly stated in the following quotations from the report of "An Eight State Project" involving Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming. Each statement is from specially prepared project papers. Names and numbers indicate author, volume, and pages.[10]

> We do not have widely accepted means for reaching children whose background has given them little or no basis for school work. To reach all or nearly all of these children is a new educational task of our schools. (Tyler: 2, p. 38)
>
> . . . programs of the future will have to give far more attention to the

learning environment as it affects the ego-development and self-concept of disadvantaged children, especially those from racial and ethnic minority groups. Attitudes and biases of teachers—conscious or not—shape behavioral patterns in children. (Passow: 2, p. 94)

Every child must have an opportunity to participate in the kind of education programs that enable him to develop his potential as a productive, contributing, self-respecting member of society. (Goldhammer: 4, p. 90)

. . . the future will demand citizens who have been trained to *think* rather than primarily to remember. Increasingly, the information available to an individual in school may become outmoded, irrelevant, or superseded before his working life is over. His continuing effectiveness should reside in his ability to solve problems and continue learning, rather than be based on his prior training and the knowledge acquired in formal schooling. (Bebell: 5, p. 2)

In place of the traditional and pervasive notions of fixed, uni-dimensional ability, we urge the importance of beginning to think of education as "the continuous creation of capacity." Thus, instead of conceiving of schooling in terms of "unfolding" and "discovery" by a teacher, of the natural abilities of a child and applying them to diverse tasks, we think, instead, of the interaction between a child, the teacher and the experiences called the curriculum as a process of the continuous creation and recreation of new domains and dimensions of capacity . . . nothing should be taught in the schools that cannot be shown, or at least strongly presumed, to have a multiplier effect upon the child's capacity. (Tumin: 7, p. 5)

If there is to be any conflict between the acquisition of knowledge and the development of attitudes and habits for the effective use of knowledge, the latter must take precedence over the former.

It is clear from the sources cited in this paper that teacher education requires dramatic changes if the teacher of the future is to retain a significant role. It is predictable that the neophyte teacher will not be successful in an educational system demanding greater individualization of instruction and greater freedom for the learner if the teacher education program is based upon the traditions of the egg-crate, thirty-to-a-classroom, highly verbalized, theoretical format. A change from such a tradition will require a thorough knowledge of modern methods of communication and, equally important, an understanding of learning processes and learner characteristics as these influence the applications of instructional technology to learning problems. Teacher education programs which are based primarily upon a model of verbal communication will not suffice.

The benefits of instructional technology for the purposes of education and for teacher education have been stated by the Commission on Instructional Technology, based upon "informed projections by educators, scholars, and specialists." The elaborations which follow each statement of the Commission are interpretations of the authors of this paper, except where direct quotations are included.

1. Technology Can Make Education More Productive

This conclusion is based on evidence that the application of instructional technology to learning will speed the rate of learning, will expand pupil comprehension, will support effectively the individualization of instruction, will reduce some of the teacher's administrative tasks, and will relieve the teacher of some of the routine jobs of information transmission.

2. Technology Can Make Education More Individual

Instructional technology has considerably expanded various modes for learning and thus provides the potential for freeing the educational system from the rigid control and standardization of what students learn, how they learn, and at what pace.

> The use of technology in education can increase the alternatives and permit the student to find his own direction more easily. The pluralism of educational objectives in a democratic society can only be reached by using a plurality of means.[11]

3. Technology Can Give Instruction a More Scientific Base

Given a set of conditions by which learning can be provided in a variety of forms and under varying circumstances, instructional technology can assist in systematizing the collection of data concerning learner characteristics and potentialities of given learning conditions. This is particularly true where student responses to certain kinds of learning can be monitored and recorded by computers.

4. Technology Can Make Instruction More Powerful

The forms of communication available in modern instructional technology give man the potential of extending his senses and of representing the world about him in new ways. One of the great values of a variety of instructional media for learners is that pictorial, nonverbal media provide vicarious experiences, much more realistic and meaningful in nature than traditional verbal and symbolic forms of communication.

Considering the nature of the environment from which contemporary learners come, (i.e. television, radio, telestar, ubiquitous sound sources, multi-colored print sources, the mobility of "wheels," and peer values and customs) it is critical that schools help the learner to examine his "culture." By engaging him in the study of his environment both in and out of school and by providing teachers who are sensitive to that culture, schools can become more relevant and the contemporary student's technology may be harnessed to school purposes.

5. Technology Can Make Learning More Immediate

Anyone who has observed significant national and international events on television needs no reminder of the motivating force of immediacy in learning. This applies as well to the instant retrieval of past events through the capabilities of remote access and recorded forms of information. To be able to "see" the event as needed, instead of depending upon second or third-hand interpretations of the event, has significant meaning for learners at all levels. This is particularly true where experiences of learners have been quite limited for reasons of environmental deprivation.

6. Technology Can Make Access to Education More Equal

> Equal access to rich learning environments is not possible without some recourse to technology . . . Technology does not have to move people; it transmits the impact of people. The limits to improving instruction through technology are political, parochial, financial—they are not inherent in technology itself.[12]

IMPLICATIONS OF INSTRUCTIONAL TECHNOLOGY FOR TEACHER EDUCATION

A premise that may be derived from the foregoing discussion is that one of the ultimate aims of an educational institution—and of the teachers in it—is to provide each learner with every opportunity to achieve his potentials. This necessitates an educational system in which materials, equipment, facilities, instructional methods and arrangements complement the efforts of each learner rather than hampering his development. As was predicted in the analysis by General Electric, education is tending in the direction of individualization of instruction. Hand-and-hand with this development, caution needs to be exercised, and hard facts gathered, that individualized instruction is instituted as a response to the needs of learners and society instead of as a "bandwagon" reaction to innovative ideas. For reasons economic, logistic, and pedagogic, there will be continued use of various instructional arrangements and methodologies, such as a mix of large group, small group, and individualized instruction. Thus, teacher preparation will require a setting, the opportunity, and a determination to search for combinations of "mediated" experiences which work best for given circumstances. There is a great deal of evidence that learners are demanding more and more relevance in their learning activities. Teacher education institutions must also recognize this in making experiences relevant for teacher trainees. Providing teacher education programs which reflect instructional technology as integral with the broad purposes of education rather than as an addendum to traditional ways, would be consistent with the position of this paper.

Two ways to implement this conception of teacher education would be, (1) to suggest in brief form the emphases and nature of programs which "integrate" instructional technology into teacher education programs, and (2) to suggest the quality of facilities and resources for teacher education necessary to achieve the hopes indicated in number one.

INSTRUCTIONAL TECHNOLOGY MODEL OF TEACHER EDUCATION–ITS NATURE

Assume that teacher education programs must provide for individual differences among teachers. Assume also that instructional technology as defined earlier in this paper needs to be applied to teacher education programs as well as to the solution of learning problems in the public schools. With these assumptions, a teacher education program which incorporates instructional technology to its fullest capabilities will reflect the following characteristics:

1. Since instructional technology by definition requires an interplay of all factors which affect the nature of a given learning experience, the teacher education program must provide experience with these interacting factors, including preparation in helping learners to be unique as well as allowing each teacher trainee to be himself.

2. Teacher education programs will provide experiences with all forms and arrangements for instruction, with recognition of balance between freedom to experiment and controls necessitated by the dictates of school organization and mass education.

3. Teacher preparation will reflect freedom of the training situation from unreasoned regimentation and will encourage freedom of trainees and learners to explore new ways to achieve mutual goals.

4. Professionalism among teacher trainees in the applications of instructional technology to learning problems will be encouraged through emphasis upon:

   a. the use of instructional media as an inquiring, discovery, reporting frame, in addition to usual expository uses.
   b. the collection of data about learner reactions to media and to the effectiveness of technological applications to learning problems.
   c. the differentiation of roles for teachers, including diagnostician of learning problems, programmer of individualized instruction sequences, evaluator of learner achievement, and manager of instructional experiences.

5. Teacher education programs will become the product of a combination of agencies, public and private, each contributing its uniqueness and expertise, encouraging the use and study of instructional technology in settings outside the school, expanding current use of local businesses and industries to the extent of having instruction provided by their own personnel and in their own facilities.

6. Teacher trainees will be encouraged to examine the benefits of instructional technology as motivators of interest among learners, in addition to ways for transmitting knowledge. Also the teacher trainee, as well as his student, should have experience in using electronic and mechanical devices for documenting and reporting phenomena and processes.

INSTRUCTIONAL TECHNOLOGY MODEL OF TEACHER EDUCATION–FACILITIES AND RESOURCES

Consideration must be given also to the adequacy of facilities and resources for teacher education. Most programs reflect a climate of scarcity when judged by the nature of their facilities, equipment, and materials. Educational institutions appear to be the last to benefit from the technological genius of an industrial society. Teachers are often prepared without benefit of the latest devices for teaching or the full range of instructional materials currently available. Part of the problem lies in the cost of equipment, in the incompatibility among different makes of equipment, in the lack of realistic budgets for keeping equipment and materials

current. Another factor relates to inadequate and poorly designed spaces for teacher education.

The implications of these conditions are clear. In order that teachers become thoroughly acquainted with the potentials of instructional technology, it is imperative that teacher education institutions provide facilities and experiences which are up-to-date. This will mean also that the public schools which provide pupils and facilities for student teachers must also complement the facilities available at the teacher training institution. Certainly not to be overlooked is the use of the community and its resources as an adjunct to the teacher training environment.

EDUCATION/INDUSTRY COOPERATION IN TEACHER EDUCATION

The Advisory Council of AOTE urges that its constituent organizations and other interested agencies become actively involved in the improved use of instructional technology in teacher education. To focus this action the recommendations below summarize the results of previous meetings of the Task Force with representatives of education and education industries. While the suggestions are categorized in terms of the agencies or organizations most likely to become involved, every agency concerned with applications of instructional technology to teacher education should consider where they may assist in each of the areas listed.

Suggestions for Teachers of Teachers

1. Apply the concepts and practices of instructional technology to the courses provided for teachers in order to provide exemplars of good usage that may be emulated later when the trainees become teachers themselves.
2. Provide workshops (such as developed by AACTE) which demonstrate varied forms of mediation as examples of how effective uses of media will support learning. Industry and school personnel should be utilized in the development of such workshops. Various professional groups (e.g. The National Council of Teachers of English) could accelerate understanding of media in the academic disciplines by holding workshops for their own constituencies.
3. Organize efforts for the re-education of people involved in teacher education regarding the nature and scope of instructional technology, the size of the investment needed for adequate materials and equipment, and the potentials of instructional technology for assisting learners. Focus also on the need for emphasizing the positive results of supporting educational manpower with adequate tools. Industry understands this. Education does not. For example, in the space of four or five years industry came to be the most sophisticated users of instructional resources as important investments in their future.
4. In light of limited amounts of money available, teacher education institutions must investigate the wider use of media (e.g. simulations, individualized instruction) as substitutes for greater numbers of people to accomplish the job of teacher education.

5. A modular, mobile center for instruction in the effective applications of instructional technology might be developed for use on campuses, at training centers, and wherever something may be learned which is significant. Part of this mobile center might take the form of institutes, staffed by personnel from campuses and industry.
6. Teacher educators might cooperate with industry in developing ways and means to foster more positive attitudes of teachers toward instructional technology as a way of solving educational problems.

Areas for Education/Industry Cooperation

1. In keeping with the movement wherein the community is cooperating more widely in education, business and industry might assist education by developing materials to interpret opportunities for learners to use the community. This material may also include information about how expertise in business and industry may be enlisted in utilizing community resources.
2. Consistent with the results of the questionnaire study referred to at the beginning of this paper, educators and industry representatives might cooperate in validating the products of industry prepared for an educational setting.
3. To alleviate the lack of adequate instructional equipment and materials in teacher education institutions, some arrangement might be made between education and industry where teacher preparation institutions and industry may share the cost of providing up-to-date materials and equipment.

Actions for AOTE

1. Encourage inputs to the ERIC Clearinghouse in Teacher Education related to the use of instructional technology in teacher education.
2. Encourage constituent organizations in teacher education to include the use of instructional technology in their supplemental guidelines to the new NCATE Standards.
3. Constituent organizations should promote models for the use of instructional technology at national, regional, state and local meetings.
4. Support should be given to the recommendation of the Report of the Commission on Instructional Technology which proposes that "The National Institute of Instructional Technology should take the lead in bringing businessmen and educators together in a close working relationship to advance the productivity of education through technology."
5. As an intermediate course of action, pending Congressional action on the recommendation of the Commission on Instructional Technology for a National Institute, a coordinating group might be set up to bring together representatives of industry and organizations such as AOTE, Educational Products Information Exchange, Educational Media Council, to plan activities relative to this paper.

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FOOTNOTES

1. Joint Committee on Programmed Instruction and Teaching Machines. *Recommendations for Reporting the Effectiveness of Programed Instruction Materials.* (Washington, D.C.: Division of Audiovisual Instructional Service, a division of National Educational Association, 1966). (Joint Committee of AERA, APA, DAVI)
2. U.S., Congress, House, Commission on Instructional Technology, Committee on Education and Labor. *To Improve Learning.* (Washington, D.C.: U.S. Government Printing Office, 40-715 O), p. 59. (A Report to the President and the Congress of the United States)
3. *Ibid.*, pp. 61-62.
4. *Ibid.*, p. 38.
5. *Ibid.*, pp. 39-40.
6. See *Professional Teacher Education I & II:* A Programed Design Developed by the AACTE Teacher Education and Media Project (1968); and Herbert Schueler, Gerald S. Lesser, and Allen L. Dobbins, *Teacher Education and the New Media* (1967), published by the American Association of Colleges for Teacher Education.
7. Proceedings of Education Media Leadership Conference. (Iowa City, Iowa: The University of Iowa, 1970). (Proceedings to be published in late 1970).
8. *Our Future Business Environment: Developing Trends and Changing Institutions.* (New York City: Business Environment, General Electric Company, ERM-85A, April, 1968), pp. 49-71.
9. *Ibid.*, p. 20.
10. *Designing Education for the Future: Rationale, Procedures and Appraisal.* (Denver, Colorado: 1362 Lincoln Street, An Eight State Project, June, 1969).
11. *Op. cit., To Improve Learning,* p. 31.
12. *Ibid.*, pp. 33-34.

Appendix A

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Appendix B

Constituent Organizations of AOTE

American Association of Colleges for Teacher Education
American Association for Health, Physical Education, and Recreation
American Association of School Administrators
American Association of School Librarians
American Home Economics Association
American Vocational Association
Association for the Education of Teachers in Science
Association for Field Services in Teacher Education
Association for School, College, and University Staffing
Association of Teacher Educators
Council for Exceptional Children
International Reading Association
National Association for Business Teacher Education
National Council of Teachers of English
National Council of Teachers of Mathematics
Society of Professors of Education